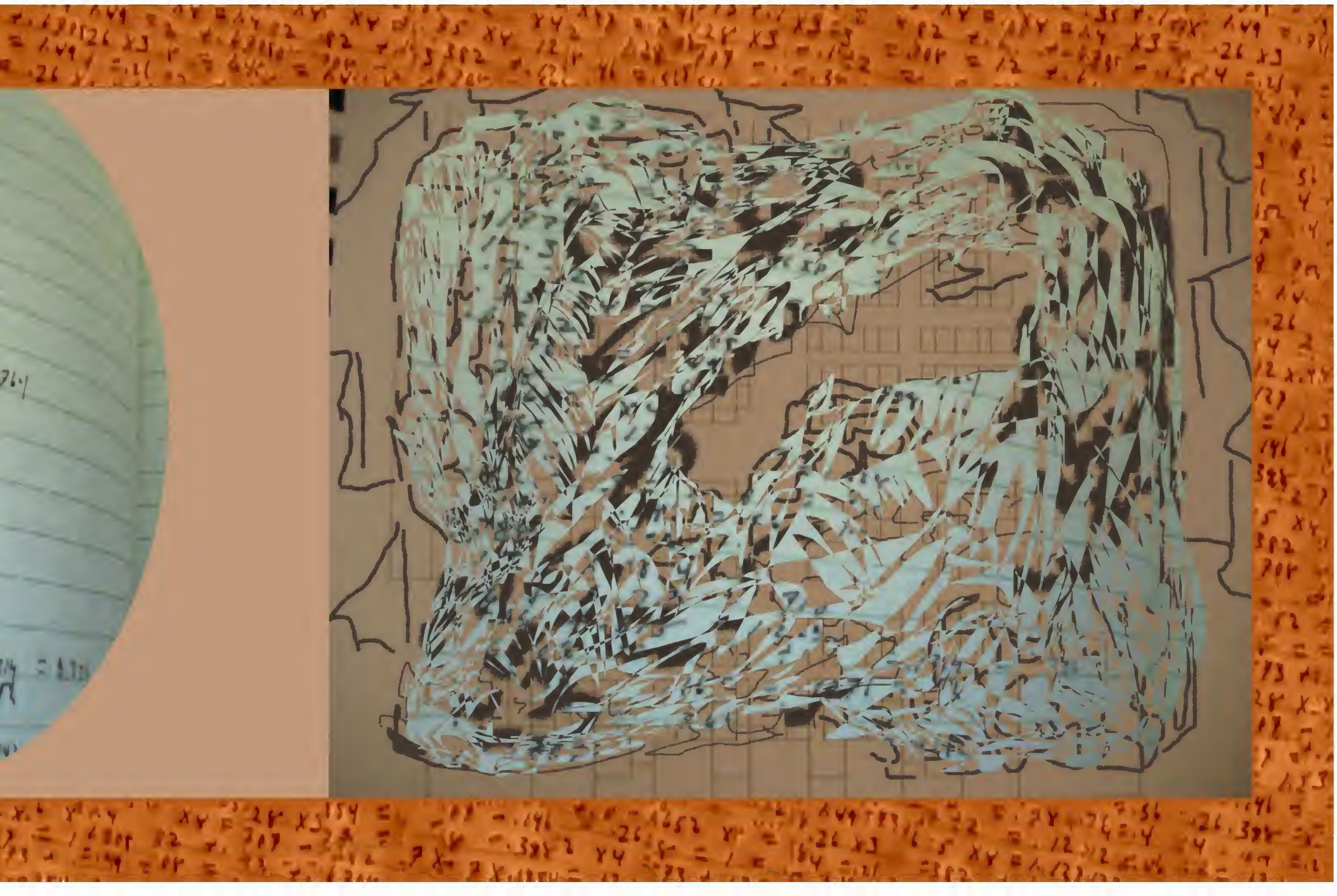
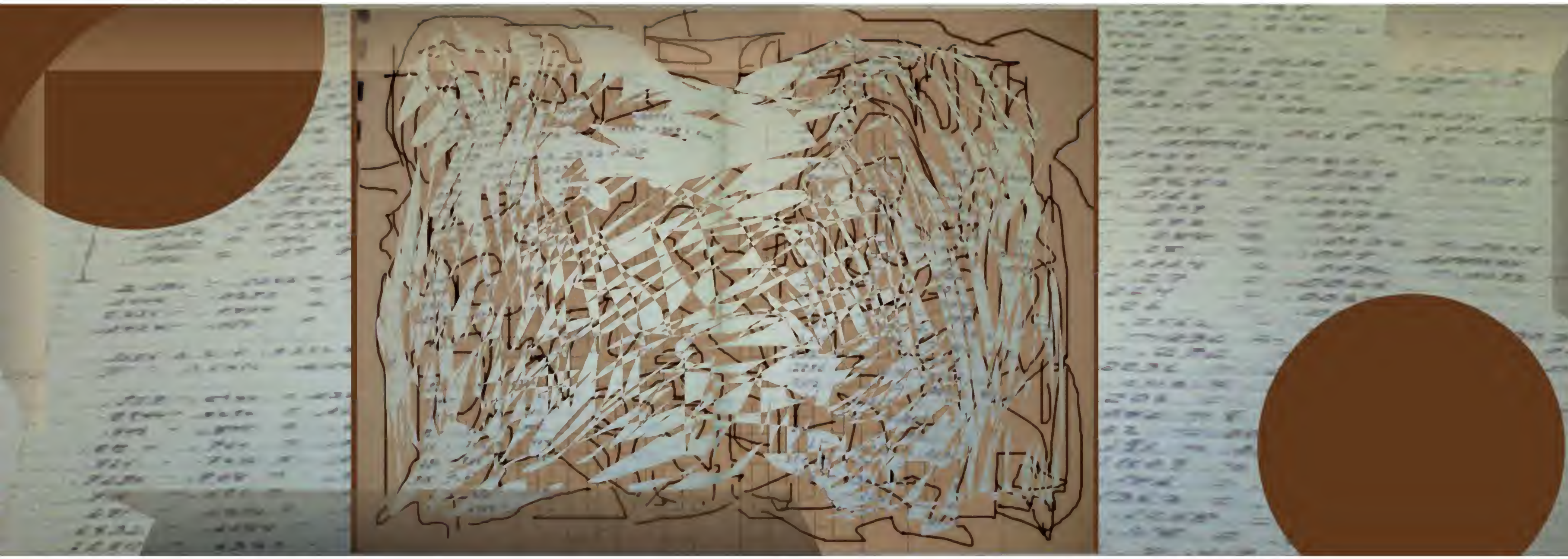
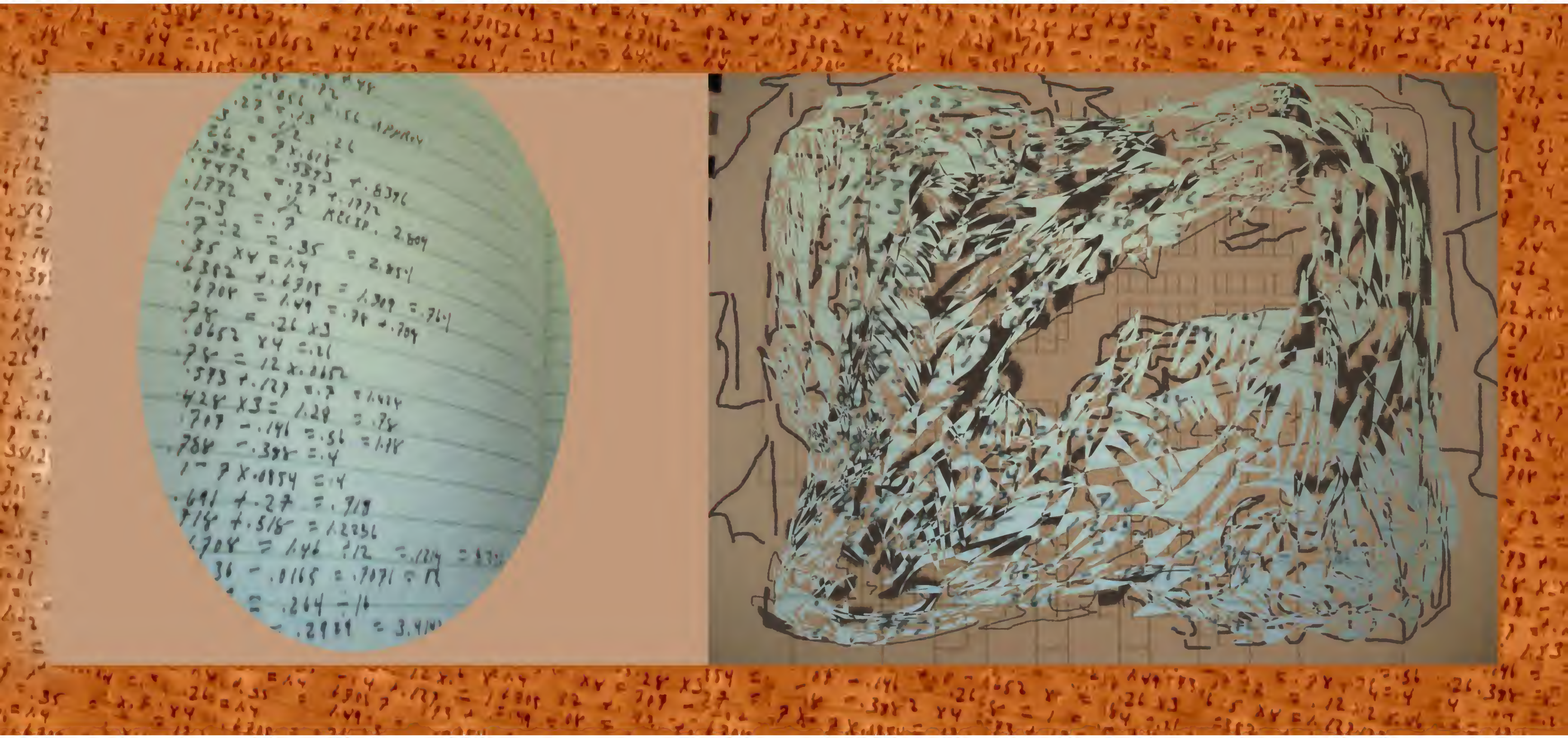
Golden Section Become Personal Rhizome

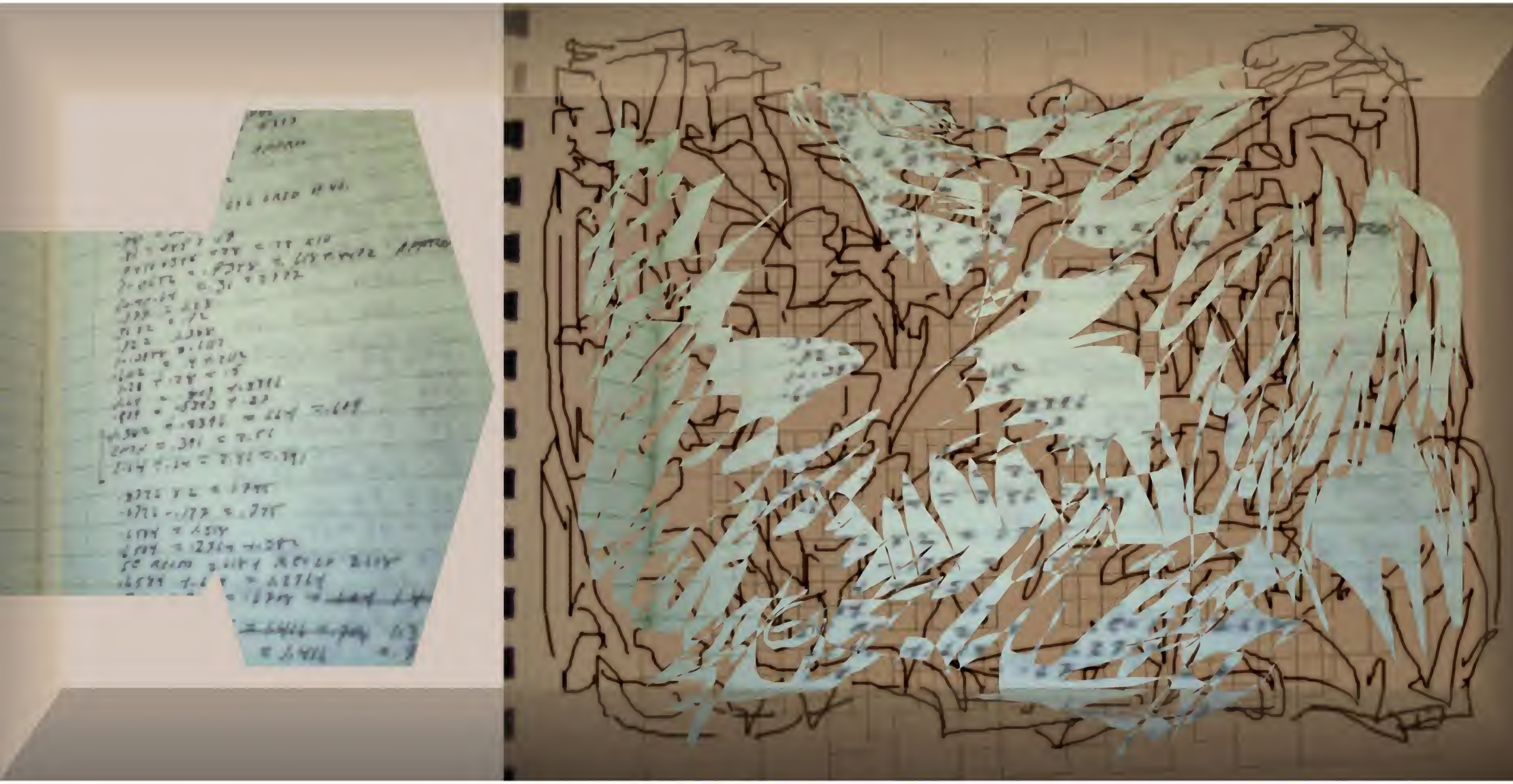
Distant Background of a Current Cyber Drawing Series

Edwin VanGorder





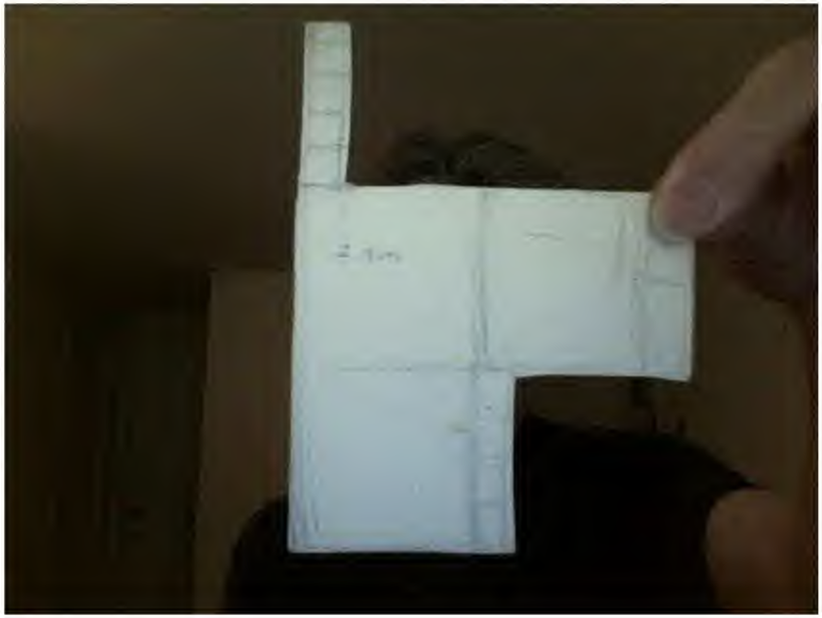

.7 ÷ 2 = .7
.35 X4 = 1.4
.6382 + .6708 = 1.309 = .761
.6708 = 1.49
.0652 X4 = .21
.428 X3 = 1.28 = .78
.707 − .141 = .56 = 1.18
1 − 7 X .0854 = .4
.691 + .27 = .918
.718 + .518 = 1.2236
.36 − .0165 = .7071
= .264 − 16
.2989 = 3.414



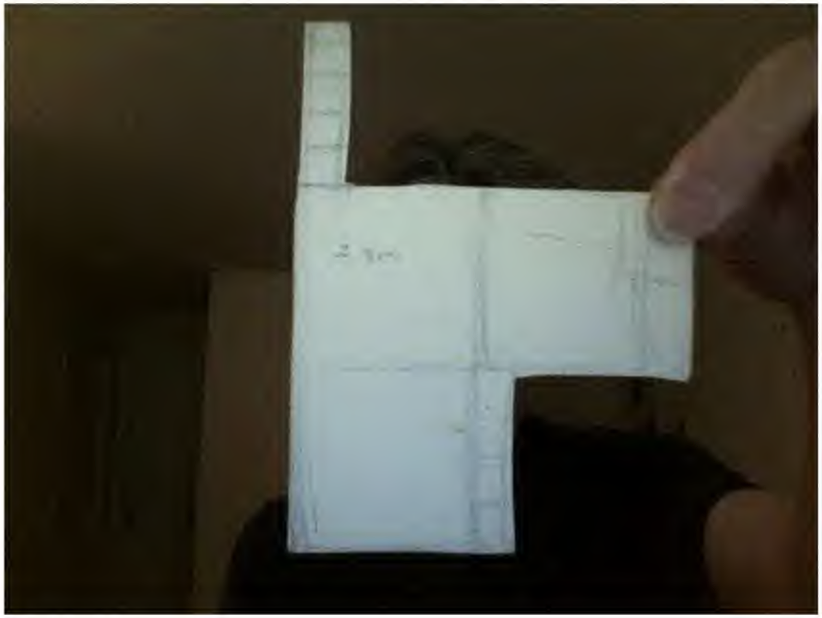
Golden Section Become Personal Rhizome

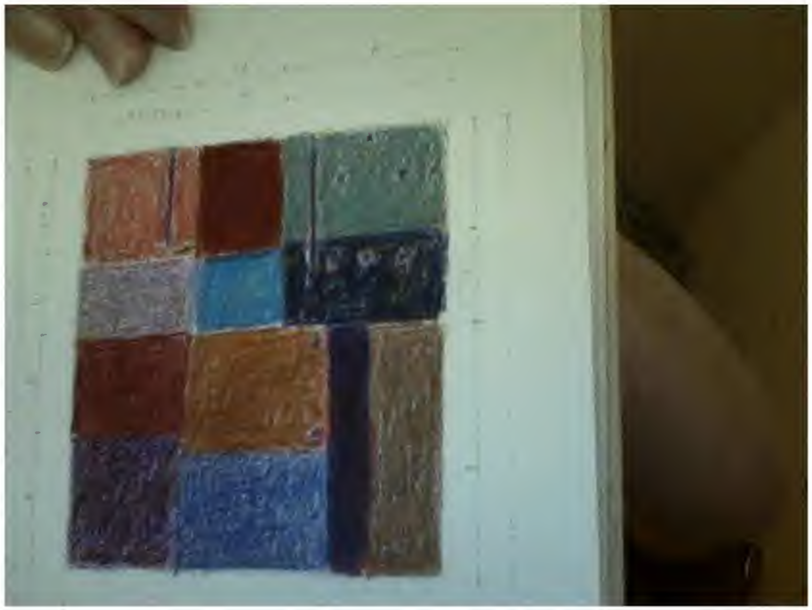
Distant Background of a Current Cyber Drawing Series

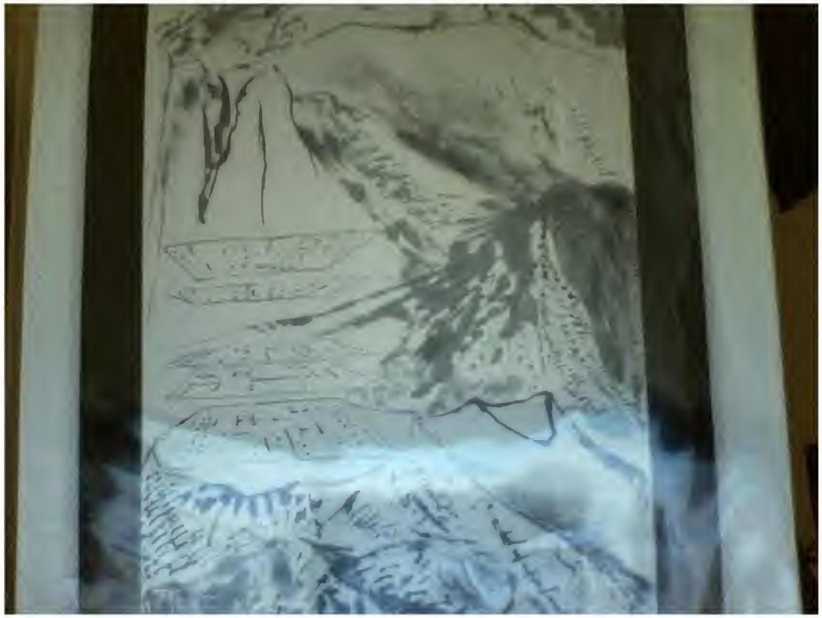
The grid I draw on is a golden section grid and in my current series which the first three drawings represent I use the numerical values as written for mathematical architectural plans I previously devised as "text mapping's" which become part of the drawing hatching: thus two systems of drawing become oddly embedded.
The long history of the section prior to this series is given its moment in the rest of the book ranging from a method developed for creating a golden section grid I created, plans, projections and numerical "programs" which I will continue in the ongoing series to use as text mapping's.

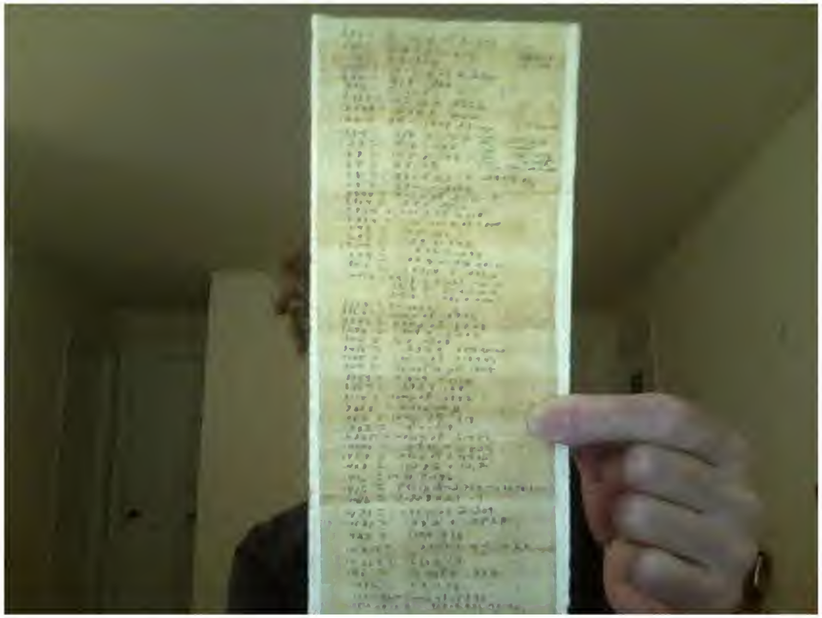


"model" of a ratio in relation to its being cut in half vertically or horizontally









COMP. 4
854 X 8 = .6382
X 9 = .76 APPROX
X 10 = .854
.0606 = .9394 = 11 X .0
.0606 = .1304
.0606 = 1.91
= .5216 = 1.91
.191 X 10 APPROX
.0248 = .9572 = .191 X 5
.0472 X 15 = .708
.054 = 7 X .0064 APPROX
.236 X 7 = 1.56 = .64

427

191

.202 = ½ recip of 2.472

.206 = .618 ÷ 3 = [illegible]

.2112 = 2 x .1056

.2236 = ½ recip of 2.236

.236 = .618 - .382

.2512 = [illegible]

.2562 = .2236 + .0326

.2562 = .045 + .2112

.26 = .09 + .1708 Aprox

.264 = .118 + .146

.27 = .416 - .146

.27 = 1 - 5 x .146

.27 = 3 x .09

.28 = (.0854 x 3) + .0854 [illegible]

.28 = .292 - .0124

[illegible]

[illegible] approx
.551 + .288 approx
[illegible]
[illegible] .7492
= .2618
= [illegible] = 1.518
.944 + .7236
.43 + .8326
.7492
.584 = 1.618 [illegible] recip × 3 = [illegible]
× .6584
.6584
.832 = [illegible]
.583 approx.
.3292
.858 = [illegible] = .788 + .706
.3944
44 = ~~[illegible]~~ .7236
44 = [illegible] × 2 = .2236
.3292 × 2 = .6584
.8292 × 2 = 1.6584
.288 = .4712
.26 approx.
.288 approx

.236
= .146 × 10
4 = 1.854 approx
.24
approx

1 − [illegible]
.8546 [illegible] = .382
[illegible] = .745
.8236 × 2 [illegible]
[illegible]
[illegible] = .927 [illegible]
.927 × [illegible] = [illegible] = .75
1.854 = .8396 [illegible]
= recip [illegible] + [illegible] recip of [illegible]
1.191 + .5955 = .788 approx
1.618 = .8726 + .745
1.618 = .788 + .8292
[illegible]

2.4472 = .4086 = .409 approx
.409 × 4 = 1.64 approx = [illegible]
.745 = .4492 × 3 = 1.3476
1 − .3476 = .6584 = [illegible]
.318 = .1727 × 3
.1727 × 4 = .69[illegible]
.618 − .518 = .1
.1056 − .1 = .0056 = [illegible]
1 − .0652 = .0348
.0348 − .0278 = [illegible]
.075 × 3 = .225
.045 × 3 = .135
.236 − .255 = [illegible]
.135 × 2 = .27
comp of ~~[illegible]~~ [illegible] .518 = [illegible]
1 − .472 = .528 − [illegible] = [illegible]
.528 = .264 × 2
1.691 = .591 = .518 + [illegible]

2.474 x .0256 = 7232
2.858 x .0652 = 4472
4.235 x .0256 = .4472
.945 = .3 x .4472
= 1.3416
.518 = .1727 N.S.

[illegible]

.28 - .2764 = [illegible]

.2764 - .27 = [illegible]

.27 - .264 = [illegible]

.264 - .26 = [illegible]

.26 - .2562 = [illegible]

.2562 - .256 = [illegible]

[illegible]

.206 = [illegible]

[illegible]

.6892 - .6584 = .0308

.6584 - .6382 = .0202

[illegible]

The Golden Section

And Free Hand Drafting

by

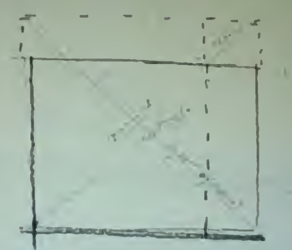
Van Van Gorder

Other Notes: The method used in all the drawings of this text will be that of listing the side to length ratio of a rectangle along its diagonal.

Therefore it is important to remember that this is not the objective length of the diagonal itself as the hypotenuse of two right triangles reflecting accross the diagonal of a rectangle.

The listing on the diagonal is using the diagonal as a typographical entity only.

For any rectangle at all we encounter, these relations attend and by "applying a square" the original framework can be reestablished.



The original line segment of course implied by its two distinctions a ratio in that one will fit into the other to a certain degree or number of times.

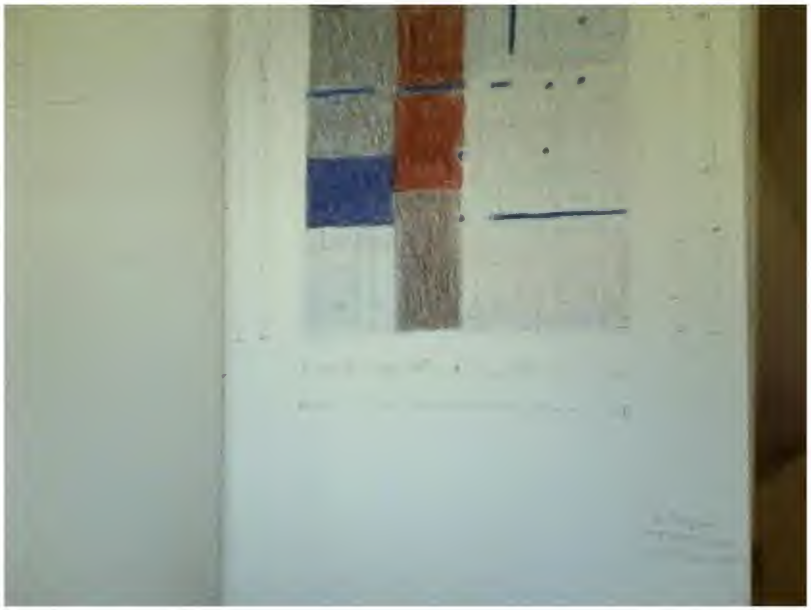
The relative sizes of the two squares also express this same ratio, one square is the ratio expression of the other.

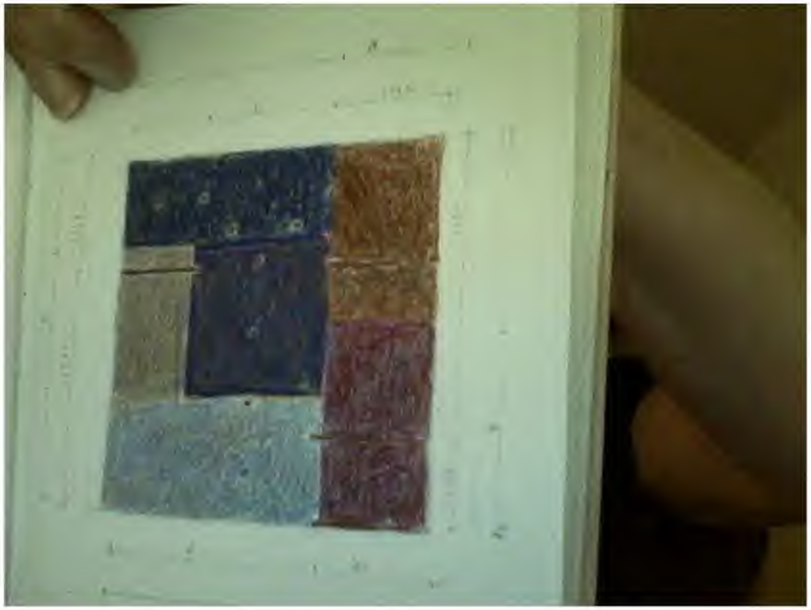
The Greeks appreciated this relationship without applying numbers; instead they "applied a square" as in the previous "reconstruction".

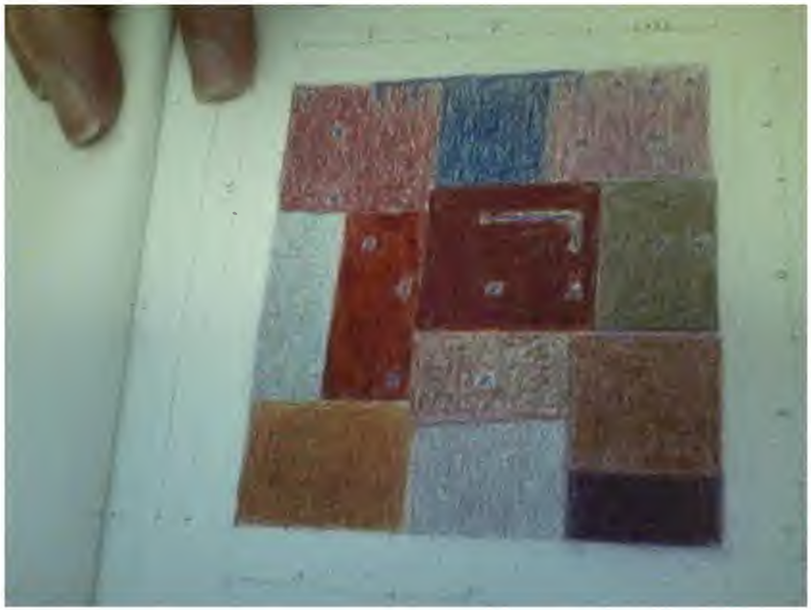
The following is a chart of the Golden Section forms most frequently used by the Greeks and which form a matrix of working forms for further development.

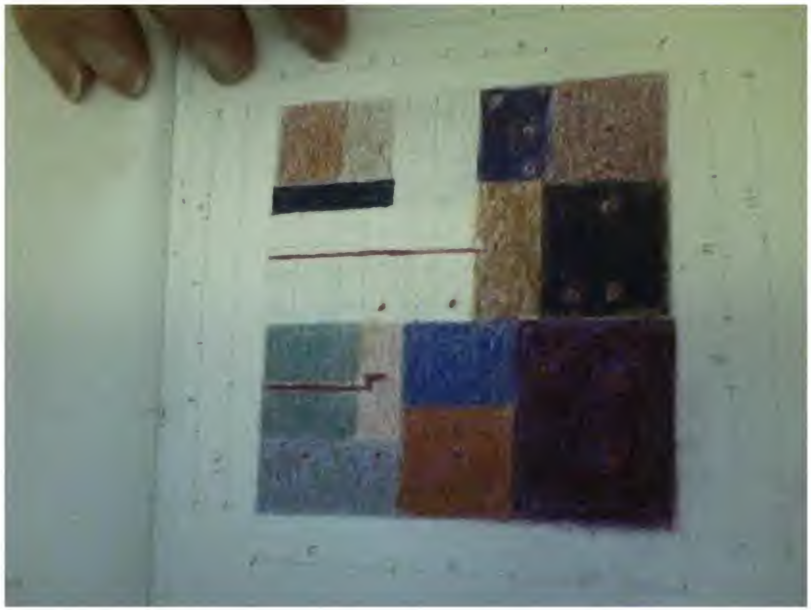
Ratio	~~1/2 Ratio~~	Reciprocal	1/2 Reciprocal
1.118	.8944	.559	.4472
1.191	.8396	.5955	.4198
1.236	.809	.618	.4045
1.309	.764	.6455	.382
1.382	.7236	.691	.3618
1.4472	.691	.7236	.3455
1.618	.618	.809	.309
1.809	.5528	.9045	.2764
1.854	.5393	.927	.2696
2.236	.4472	1.118	.2236
2.309	.433	1.1545	.216
2.472	.4045	1.236	.202
2.4472	.408	1.2236	.204
2.618	.382	1.309	.191
2.764	.3618	1.382	.1809
2.809	.3559	1.4045	.1779
2.8944	.3455	1.4472	.1727
3.236	.309	1.618	.1545
3.427	.2918	1.7135	.146
3.618	.2764	1.809	.1382

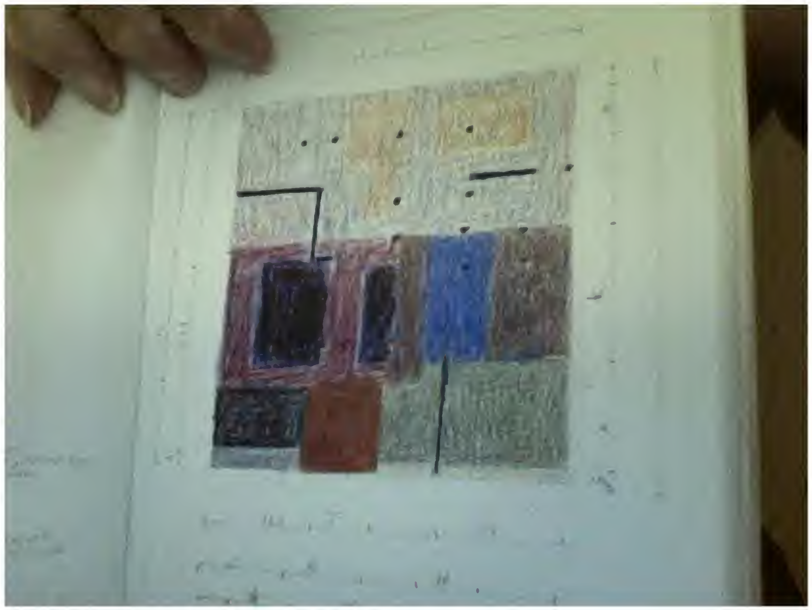
.264 = .118 + .146 [illegible]
.27 = .416 − .146 [illegible]
.28 = 1 − .4 × .146 [illegible]
.28 = 2 × .09 [illegible]
.28 = (.8454 × .25 + .03584) [illegible]
.28 = .292 − .0084
.2848 = [illegible] of .2152 − .5
.2864 = .2 × .0004
.2864 = recip of 2.418
.2764 = 1 − recip of 1.004
.292 = 2 × .146
.292 = .09 + .202
.309 = .236 + .073
.309 = .03 + .28 error
.309 = .2764 + .0326
note .2918 = 3.427 recip
.2918 = .27 + .2018
.2918 = .246 + .0458
.3168 = 2 × .1584
.3168 = comp of .6832
.3292 = comp of .6708
.3292 = .309 + .0202
.3416 = 2 × .1708
.3455 = .292 + .054 aprox
.3455 = recip of 2.8944
.354 = ½ ratio of .708
.3559 = 2.809 recip











The full range of shapes indicated in the previously detailed scale may be created through transpositions on the matrix format.

The following transpositions (areas superimposed upon one another in order to determine a subtraction) will give a preliminary or basic vocabulary to consider.

.618 - .382 =.236 reciprocal = 1 divided by .236 = 4.236.
.382 - .236 = .146 and reciprocal = 1 divided by .146 = 6.854.
.236 - .0652 = .1708 and reciprocal = 1 divided by .1708 = 5.854
1.854 = .618 x 3 and reciprocal = 1 divided by 1.854 = .5396.

Note that to find the reciprocal of a number it is divided into one whether less than one as in .236 or more than as above.

.382 divided 2 = .191 and reciprocal = 1 divided by .191 = 5.236.
.5528 = complement of .4472 and reciprocal = 1 divided by .5528 = 1.809.
1 - .191 = .809 and reciprocal = 1 divided by .809 = 1.236.
.5528 - .4472 = .1056 and reciprocal = 1 divided by .1056 = 9.472
Note .472 = .236 x 2 and 9.472 = 4.236 (2) + 1.
.1056 - .0652 = .0404 which is a very powerful building block.
(see index) reciprocal of .0404 = 1 divided by .0404 = 24.752
divided by 4 = 6.18 and 6.18 = .618 x 10.

Note also in the index the numbers derived from .0404 such as .0202, .0808, .0101, etc.

.0652 - .0202 (i.e. .0404 divided by 2) = .045 or .236 - .191 = .045 .045 is the most common building block and its reciprocal is 22.222. 1 - .0101 = 22 x .045 and each .045 shape marks of an important Golden Section derivative (see index).
.045 + .0404 = .0854 = 1/2 .1708
.0854 x 3 = .2562 (.2562 = 3 x .1708) and .2562 + 1/2 .0854 = .30
= 3.573 and .573 x 2 = 1.146
Note .573 also = 3 x .191 and its reciprocal = 1.745 with .745 being the reciprocal of 1.3416 or .4472 x 3
Note .4472 = reciprocal of 2.236 or the sq. root of 5
.28 is also important in the form it takes in the compound rectangle 1.28 which has the provocative spiral format indicated in the Index.
.618 divided by 2 = .309 and reciprocal =1 divided by .309 = 3.236 1.4472
.0652 divided by 5 = .0124 and reciprocal = 1 divided .0124 = 80.645 divided by 3 = 27 approx. = .27 x 10 and .27 = 1/2 reciprocal of 1.854 = 3 x .618
1 - .309 = .691 and reciprocal = 1 divided by .691 = 1.4472

1.6487 div. by 3 = .55 approx.
.549 x 3 = 1.648
1.316 x 3 = 1.44
2.2214 = .866
.866 - 1.2214 = .376 = 1.4+ approx.

.416

1 - .584 - .584 = 1.7121
.7121 = 1.416
.416 = 1 - .16 x .1663
.427 x .6 = .427
.427 x .6 = .427
1.4 - .427 = 1.394
1.394 x 3 = 1.416
.416 = 1.416
.416 div. by 9 = .046
.416 = .0834 x .0466
1 - .416 = .584
.584 = .146 x 4
.416 - .1 = .3168 approx.
.416 div. by 3 = .069 = 4.416 approx.
.416 x 2 = 1.416
.416 = .27 = .146
1 - .416 = .584 = 1.712
.712 = 1.604
.584 = 1.7121
.7121 = .1 = .616 approx.
.7 = 1.428
.428 x 2 = 1.25 approx. = .76
.416 = .191 = .2236
.416 - .146 = .27
.416 div. by 3 = .1302
Comp. .416 = .584
.584 = .416 = 1.3764
.3764 = 2 x .6933

.421

.427 div. by 3 = .1135
.2135 = 4.7 approx.
.2708 = .3563 = .427
.0854 x 5 = .427
Comp. of .427 = .573
.400 = .118 = .427
.037 = .4 = .037
.191 = .236 = .427
.573 = .3 = .073
.1708 = .2563 = .427
.427 = .1382 = .5886
.427 = .382 = .045
.584 = .573 = 1.101
.371 = 1.749
Area .76 = .1086 x 7

[illegible] 182 div. by [illegible]
[illegible] 1.144 = .182 x [illegible]
[illegible] 24 = .0128
[illegible] .81 of 2 = .872
[illegible] x 8 = .48
[illegible] x 8 = 3.882 = 2 x .0446
[illegible] x 2 = .784 = .182
[illegible] = .2768
[illegible] .878 = .8128 = .0418
[illegible]

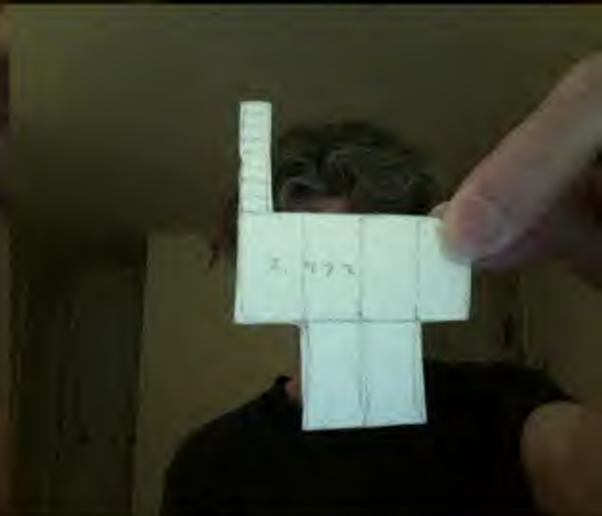
.882

.887 = .896 = .018
.406 = .103 = .003
.801 x 2 = 2.700
- .882 = .160
.881 = 1.107
[illegible] = 1.618
[illegible] div. by [illegible] = .2896 = 2.04 - .304 x 10
[illegible] .746 = 1.878
2.44 = .888 = .088
[illegible] = .894 = .034
.081 - .894 = .034

.0998

.318 = .338 = .881
.882 x 2 = 1.700
.0944 = .0812 = .3182
.0944 = .0184 = .082
.382 x .3128 = .0940
[illegible] x .0044 = .0944
.618 x .7700 = .0944
.1700 - .7336 = .0048
.0944 = 1.118
1.318 = .2230 = .0944
[illegible] .0448 = .1074
.0944 = .618 = .2700
.0944 = .0892 = .8288
.0944 = .0028 = .008
.0044 = .103 = .7700
.7700 x 2 = 1.0838
.0944 = .2112 = .0848
.0944 = .8304 = .330
.0944 = .2902 = .3818
.0944 = .2748 = .618
.0944 = .887 = .3936
.0944 = .3818 = .8180
[illegible] x 4 = 1.0882 = .0872 x .618
.0944 = .8128 = .308
.0944 = .3484 = .184
1.118 div. by 8 = .130
.130 x 2 = .28 approx
.618 = .228 = .088
.0944 = .8292 = .0808

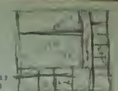

2.764



1.382 has been shown to have subtracted from it the area [illegible] or .2764.

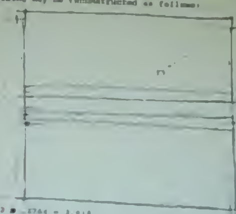
1.382 - .2764 = 1.1056 (.1056 is also the [illegible] area of the matrix).

An " applied square" separating .1056 from the unit one is met by the diagonal of 1.382 at point A and a line extended across the square at this point will create within the square a .7236 proportion. (This creation of a reciprocal within an applied square is always a consequent proportion at the point the diagonal meets the square because those shapes share the same diagonal corner to corner).



Progress: .2764 = 3.618
3.618 = .7236 = 1.382
1.618 divided 2 = [illegible]
2 x 1.382 = .2764 = 2.618 divided 5 = .5236
.382 — .2764 = .1056
1.382 = .5393 = .8106
.8109 = 1:2 ratio + 1/2 recip. + recip. of 1.381

This drawing may be reconstructed as follows:

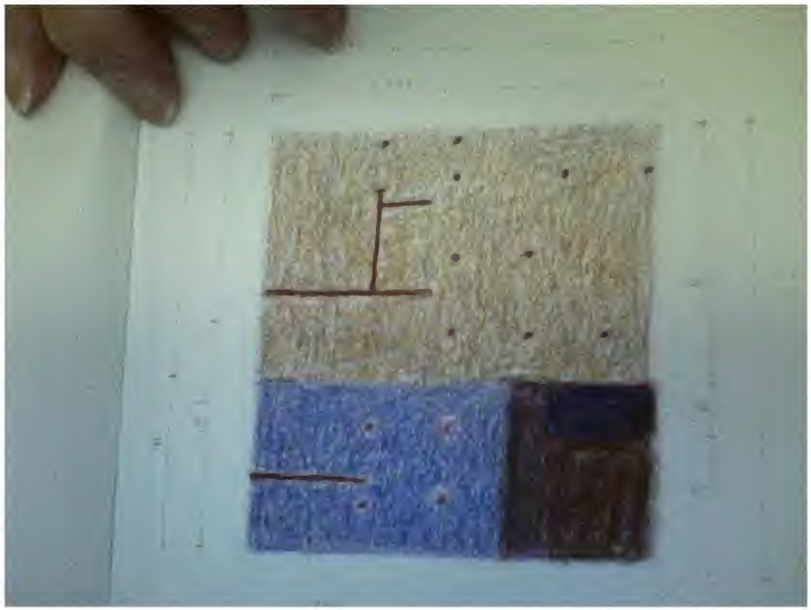


- 1 -

.5528 divided 2 = .2764 = 1.618
1.618 divided 4 = .7236
1 — .2764 = .7236
.7236 = 1.382
All areas = 1.382

- 2 -

.236 = .618 - .382
.24 = .1382 + .0101
.254 = .127 x 2
.26 = .0652
.264 = .118 + .146
.27 = .09 x 3
.2764 = .5528 divided 2
.28 = .0854 x 3 + (.0854 x 1/3)
.2888 = .1708 +.118
.292 = .146 x 2
.3 = .127 + .173
.309 = 1/2 .618
.3168 = .1056 x 3
.3292 = .309 + .0202
.3416 =.1708 x 2
.3455 = 1/2 recip. 1.4472
.35 = 1/2 .7
.354 = 1/2 .708
.3559 = recip. 2.809
.36 = .09 x 4
.3618 = .2764 + .0854
.382 = comp. .618
.3888 = .118 + .27
.4 = .4472 - .0472
.4045 = 1/2 .809
.406 = .26 + .146
.408 = .1382 + .27
.4146 = .1382 x 3
.416 = .27 + .146
.427 = .191 + .237
.433 = .382 + .0528
.44 = 1 - 2 x .28
.4472 = the square root of five and is defined in the matrix of the square by an arc with legs anchored on one side as its diameter and which meets the corner to corner diagonal of the square at which point the proportion of .4472 or the reciprocal of 2.236 may be established.
.45 = .045 x 10
.4564 = .382 + .074
.46 = 1/2 ratio .927 approx.
.472 = .236 x 2
.49 = .074 + .416
.5 = 1/2 square
.518 = .1727 x 3 approx.
.5124 = .1708 x 3
.528 = 1 - .472
.5393 = .5528 - .0135
.54 = .84 - .3 (note .3 is very simply a division in three equal parts which culminates in three equal squares).
.5528 = comp. of .4472
.56 = .28 x 2
.573 = .191 x 3



The smaller .7236 areas have been expressed as a square + a remainder, namely .382 except for one "entrance area."

The last one at A has been extended across the field or square which means that its ratio has been visualized into the overall or objective "one" or square.

Its ratio is 3.618 divided .7236 which = 5 and the reciprocal of 5 is .2; and .2 x the area it is extended across makes a visual transparency or overlap in this region which is crossed or is at namely the .7236 region of the square.

The area B is this objective ratio of .2 "at" .7236 and this area of transparency or overlap reads as A x C = B or A "by" C = B.

notes!

We have seen that divisions on a grid create similar shapes to each other and to their host field because a division on one axis is equalized by a division on the other.

This rather obvious fact has the somewhat more mysterious consequence that the rectangle spoken of as being divided has countable parts which may be spoken of as being taken a certain number of times because a counter division whether or not actually taken is implied on the opposite axis as a potential definition of equally sized sub units.

The existence of this possibility, namely the potential of a grid definition defines one axis as equalized by the other.

A rectangle as below divided in quarters shows its 1/2 ratio to be composed of two similar shapes stacked.

The same rectangle divided in quarters but set on its reciprocal axis shows that the reciprocal's 1/2 ratio = the same two shapes but stacked end to end relative to the first drawing.

A 1/2 ratio therefore counts against one axis and a 1/2 reciprocal counts against the other.

Here, the 1/2 ratio is composed of two similar shapes to the whole which may be counted against the opposite axis as two in number.

The grid format will always show that a division by a certain quantity will yield the reciprocal of the field taken the number of times of the division itself.

The Formative Matrix

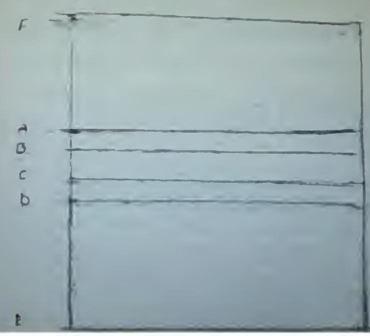
The formative matrix will provide by transpositions a complete range of Golden Section divisions as they may be located within a square. This formative matrix is a quincunx (cross in square) format composed of the overlapping of the square root of five and of the Golden Section when they are composed within the same square.

This scale or framework of relative values that may be composed as a harmonic whole within a square and which constitutes a measuring tool is as follows in its sequence of divisions :

	.1708
.0004	.1727
.0048	.173
.004	.18
.0064	.1809
.0078	.1927
.0101	.202
.0124	.203
.0135	.204
.0156	.206
.0202	.2112
.0248	.2236
.0326	.236
.0348	.2516
.0385	.255
.0404	.2562
.045	.26
.046	.264
.0528	.27
.0652	.2764
.054	.28
.055	.2888
.056	.292
.073	.3
.074	.309
.078	.3168
.0808	.3292
.0854	.34
.09	.3416
.101	.3455
.1056	.35
.118	.354
.1208	.3568
.135	.36
.1382	.3618
.146	.368
.16	

The formative matrix in its simplest and most useful form is shown below.

Rectangle AE = .618
Rectangle AF = .382 = complement of .618
Rectangle DF = .618
Rectangle DE = .382 = complement of .618
Rectangle BF = .4472 = square root of 5
Rectangle BE = .5528 = complement of .4472
Rectangle CE = .4472 = square root of 5
Rectangle CF = .5528 = complement of .4472
Rectangle BC = .1056 = 1 - (2 x .4472)
Rectangle BC = .1056 also = .5528 - .4472
Rectangle AB = .0652 = .4472 - .382
Rectangle AB = .0652 = .618 - .5528
Rectangle CD = .0652 = .4472 - .382
Rectangle CD = .0652 = .618 - .5528
Rectangle AC = .1708 = .1056 + .0652
Rectangle BD = .1708 = .1056 + .0652
Rectangle AD = .236 = .1056 + (2 x .0652)
Rectangle AD = .236 = .1708 + .0652



1.0 [illegible] | .
.1056 | .382
.0652 | .236
.0404 | .146
.0248 | .09
.0156 | .056
.009
.0064
.004
.0026

$\sqrt{5}$ Forms = 1.118
1.382
1.4472
2.764
2.4472
1.3416 = .745

1.809 − 5 = 3618
3.618 − 5 = .7236

2.449 [illegible]

[illegible]
Note 3.618 × .2764 = 1.000
= 1 − .2764

4.236 × .1056 = .4472
4.236 × .0652 = .2764
2.618 × .236 = .2764 [illegible]
2.618 ÷ .4472 = .146
.146 = 6.854 × .1056 = .7236
6.854 × .0652 = .4472
2.236 × .1056 = .4472

.584

Note .518 = .1727 × 3
.3416 = 2.927 − 1 = 1.927 × .518
1 − .3416 = .6584 = 1.518
.1727 = $\frac{1}{2}$
recip = .8944
.8944 = 1.118

.382
=
.472
2

288 = 3.46 ÷ 5 = .691
.5528 − .288 = .264
= 3.788 − 7 = .54
.788 = [illegible]

.078 = recip of .128
.0854 = 1/2 .1708
.09 = 2 x .045
.09 = .292 - .202
.101 = 1/2 .202